A Relational Database Application: The Glaucoma Tables of the American Society of Cataract and Refractive Surgery (ASCRS) National Outcomes Database Library

[♦♦]Joalin P-K Lim, [♦]Wendy Steger, [♦]Nancy Wicklin, & [♦♦]Jerome Abrams
[♦]Departments of Surgery, [♦]Biomedical Engineering Institute, and [♦]Health Informatics Program, University of Minnesota, Minneapolis, Minnesota

INTRODUCTION

In order to meet the challenges in health care reform, an outcome system is needed for the health care provider to measure, analyze and communicate key indicators. These variables include clinical, economic and patient-reported outcomes, as well as data related to medical-surgical procedures, devices. Outcomes management is increasingly important in a world that seeks healthcare accountability and where the survival of physician practices, hospitals and managed care institutions depends on the ability to deliver quality medical care while containing costs. In this paper, we examine the Glaucoma Tables of the American Society of Cataract and Refractive Surgery National Outcome Database Library. We report the conversion of an currently existing flat-file, non-normalized database format into a normalized, relational database system. The new format will reduce disk storage space, improve data accuracy, and facilitate the analysis of longitudinal patient outcomes.

METHODS

An Entity-Relationship (ER) diagram was constructed using the CASE modeling tool, Silverrun V2.1. The ER diagram serves as the database schema that depicts the creation of the new entities that were used to develop a relational database in third normal form. Each entity of the data model was entered as a table utilizing Microsoft Access V2.0, Relational Database Management System for Windows. Data dictionaries for each form were obtained from Summit Medical Systems Inc. and were used to determine field lengths and types. Miscrosoft Access provides Structured Query Language (SQL) and a Open Database Connectivity (ODBC) driver that allows all the tables to be stored in a standard format which can be read by any ODBC compliant database. This way, the prototype database can be easily incorporated into any database format to be used by Summit Medical Systems, Inc. in clinical software development.

DISCUSSION

In the flat file system, the paper and electronic forms used for inputing patient data were very user-friendly. In the relational system, Access can be used to create a view that simulates the screen layout that is currently in use. This will ensure user-friendly data-entry. The normalized database design will eliminate wasted storage space, because it will reduce the storage of redundant data or empty space. The system also has a tailor-made view for each type of user, which supports ad-hoc queries to faciliate the longitudinal analysis of the patient outcomes.

CONCLUSION

The Glaucoma Tables of the ASCRS National Outcomes Database Library was developed conjunction with Summit Medical Systems, Inc. The flat file system was first designed at Summit Medical, using Summit Vista for Microsoft Windows. A reliable and flexible relational database was created by transforming the flat-file database schema into a normalized form using the Silverrun CASE data modeling tool and Microsoft Access. The final normalized database application includes 4 different user views and 3 different clinical outcomes reports. This new system fulfills the goals of reducing storage space, improving data accuracy and allowing the analysis of longitudinal patient data.

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